

# INTERAGENCY ECOLOGICAL PROGRAM 2013 ANNUAL WORKSHOP

APRIL 24 – 26, 2013  
LAKE NATOMA INN  
FOLSOM, CA



Interagency  
Ecological Program

COOPERATIVE ECOLOGICAL  
INVESTIGATIONS SINCE 1970

## WORKSHOP AT A GLANCE

All oral presentations will be in the Sierra Ballroom and the poster reception will be held in the Pavilion.

### WEDNESDAY, APRIL 24

8:00 – 10:15	IEP Registration and Poster Set-up
10:15 – 10:20	Joint IEP and CWEMF Introduction
10:20 – 11:40	Session I - Models of Ecosystem Dynamics
11:40 – 1:10	Lunch
1:10 – 3:00	Session I (continued) - Models of Ecosystem Dynamics
3:00 – 3:20	Break
3:20 – 4:10	Session II - IEP and MAST Update
4:10 – 6:00	IEP Poster Set-up and Viewing

### THURSDAY, APRIL 25

8:30 – 9:50	Session III - First Flush at Second Blush
9:50 – 10:10	Break
10:10 – 10:30	Haiku/Poetry Slam Poster Introduction Blitz
10:30 – 12:10	Session IV – From the Rivers to the Bay I: New Tools and Technologies for Understanding and Managing Rivers and Estuaries
12:10 – 1:30	Lunch
1:30 – 3:10	Session V - Making the Most of IEP Monitoring Data: Opportunities and Challenges
3:10 – 3:30	Break
3:30 – 5:00	Session VI - Everybody Talks About it, What are we Doing About it? Collaborative Science Panel Discussion
5:00 – 7:00	Poster Reception

### FRIDAY, APRIL 26

8:10 – 10:10	Session VII - Water Quality and Lower Trophic Dynamics
10:10 – 10:30	Break
10:30 – 12:10	Session VIII - Examining Health and Diet Thresholds of Delta Smelt
12:10 – 1:30	Lunch
1:30 – 2:50	Session IX – Tidal Habitat Restoration in the San Francisco Bay: Examples on How to Monitor and Detect Ecosystem Change
2:50 – 3:10	Break
3:10 – 4:30	Session X – From the Rivers to the Bay II: Examining Biological Production, Fish Movement and Trends

## GENERAL INFORMATION

**Overview:** The Interagency Ecological Program (IEP) for the San Francisco Estuary / Sacramento-San Joaquin Delta consists of nine member agencies, three State (Department of Water Resources, Department of Fish and Wildlife, and State Water Resources Control Board) and six Federal (Fish and Wildlife Service, Bureau of Reclamation, Geological Survey, Army Corps of Engineers, NOAA Fisheries, and Environmental Protection Agency). The IEP also partners with the San Francisco Estuary Institute, the Delta Science Program, and many academic and private scientists. The mission of the IEP is, in collaboration with others, to provide ecological information and scientific leadership for use in management of the San Francisco Estuary. More information about the IEP can be found at <http://www.water.ca.gov/iep/>.

The annual IEP Workshop serves as a focal point for IEP activities. The program for this year's Workshop is diverse, with many oral and poster presentations and some new activities. This year's Workshop once again features a full three-day program and coordination with the California Water and Environmental Modeling Forum (CWEMF, <http://cwemf.org/>). The CWEMF annual meeting is taking place April 22-24 at the Lake Natoma Inn, and a joint CWEMF-IEP session about ecosystem restoration modeling will be held on April 24. There will also be a panel discussion about collaborative science featuring IEP agency Directors, scientists and stakeholders of the IEP on April 25. Also on April 25, the IEP will host a luncheon for early career scientists to meet with established IEP professionals and academia.

**2013 IEP Workshop Program Committee:** Lenny Grimaldo (USBR, Chair), Josh Israel (USBR), Lori Smith (USFWS), Fred Feyrer (USBR), Steve Culberson (USFWS), Louise Conrad (CDWR), Elaine Bartolomew (CVRWQCB), Kari Daniska (CVRWQCB), B.J. Miller (San Luis and Delta Mendota Water Agency), Deanna Serrano (CCWD), Matt Moses (CCWD), Anke Mueller-Solger (DSC), and Kelly Souza (CDFW).

## WEDNESDAY, APRIL 24

### JOINT CWEMF AND IEP INTRODUCTION AND RESTORATION MODELING SESSION

Moderator: Lenny Grimaldo (USBR)

Location: Sierra Ballroom

10:15 – 10:20

### SESSION I – MODELS OF ECOSYSTEM DYNAMICS

Moderator: Chris Enright (DSC)

Location: Sierra Ballroom

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10:20-10:40	We Need to do the Modeling: Imagining How Models and Modelers Advance Understanding of the San Francisco Estuary	Chris Enright, DSC
10:40-11:00	Physical Processes Influencing Habitat at a Breached Delta Island: Implications for Restoration Management and Planning	Matt Brennan, ESA
11:00-11:20	Bay-Delta EDT: A Tool for Restoration Planning	Chip McConnaha, ICF
11:20-11:40	Are Shallower, Slower Habitats Necessarily “Greener”? How Clams Upend Conceptual Models Guiding Ecosystem Management in the Delta	Lisa Lucas, USGS

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**11:40 – 1:10      Lunch      Location: Area restaurants**

### SESSION I (CONTINUED) – MODELS OF ECOSYSTEM DYNAMICS

Moderator: Marianne Guerin (RMA)

Location: Sierra Ballroom

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1:10-1:30	Yolo Bypass Ecosystem Reconciliation – Insights from Many Models and Lots of Field Work	Robyn Suddeth, UCD
1:30-1:50	Mathematical Models in Support of Restoration: Examples from the Klamath Basin and Beyond	Mike Deas, Watercourse Eng.
1:50-2:10	San Joaquin River Restoration Program Use of Modeling Tools to Guide Floodplain Restoration	Katrina Harrison, USBR
2:10-2:30	Applying Modeling Results to Tidal Restoration Project Alternatives Development and Selection: Prospect Island	Stuart Siegel, WWR
2:30-3:00	Habitat Restoration in the Delta: The Delta Independent Science Board Review	John Wiens, Delta ISB

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**3:00 – 3:20      Break**

**SESSION II – IEP INTRODUCTION AND MAST UPDATE**

MODERATOR: DAVID VAN RIJN (USBR)

LOCATION: SIERRA ROOM

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3:20-3:50	IEP Introduction, Science Highlights, and Program Update	Anke Mueller-Solger, DSC and Gregg Erickson, CDFW
3:50-4:10	MAST Synthesis Report: A Four Year Comparison of Delta Smelt Drivers	Larry Brown, USGS

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**THURSDAY, APRIL 25****SESSION III – FIRST FLUSH AT SECOND BLUSH**

Moderator: Mike Hoover (USFWS)

Location: Sierra Ballroom

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8:30-8:50	Delta Sediment Transport and Turbidity During the December 2012 'First Flush' Runoff Event	Scott Wright, USGS
8:50-9:10	The Hydrodynamics of Position Maintenance and Upmigration of Delta Smelt	Jon Burau, USGS
9:10-9:30	Riders on the Storm: Tides, Turbidity, and Transitory Traveling Delta Smelt	Bill Bennett, UCD
9:30-9:50	Feeding Ecology of Adult Delta Smelt During a Seasonal Pulse of Turbidity	Aaron Johnson, SFSU-RTC

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**9:50 – 10:10      Break****10:10-10:30** Haiku/Poetry Slam Poster Introduction Blitz

Moderator: Steve Culberson (USFWS)

**SESSION IV – FROM THE RIVERS TO THE BAY I: NEW TOOLS AND TECHNOLOGIES FOR UNDERSTANDING AND MANAGING RIVERS AND ESTUARIES**

Moderator: Tanis Toland (USACE)

Location: Sierra Ballroom

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10:30-10:50	Facilitating Science Communication and Community: California Estuary Monitoring Workgroup Tool	Val Connor, SFCWA
10:50-11:10	The Pulse of the Estuary: Continuous Monitoring Reveals How Conditions in the Lower Sacramento River are Connected to Processes in Liberty Island	Bryan Downing, USGS
11:10-11:30	DNA Barcoding of Zooplankton from Delta Smelt Gut Contents	Tomo Kurobe, UCD

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11:30-11:50	Application of Telemetry and Hydrodynamic Data for Levee Design on the Sacramento River	Dave Smith, USACE
11:50-12:10	SmeltCam: Underwater Video Codend for Trawled Nets: An Application to the Distribution of Delta Smelt	Fred Feyrer, USBR

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**12:10 – 1:30**      **Lunch**  
Location: Area restaurants

**12:10-1:30**      **Early Career Scientist Mentor Social**  
Folsom Room

## **SESSION V – MAKING THE MOST OF IEP MONITORING DATA: OPPORTUNITIES AND CHALLENGES AHEAD**

Moderator: Joe Kirsch (USFWS)

Location: Sierra Ballroom

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1:30-1:50	Collapse of South and East Delta Fishes in the Summer Townet Survey	Katherine Osborne, CDFW
1:50-2:10	Estimating the Reproductive Potential of Delta Smelt	Lauren Damon and Julio Adib-Samii, CDFW
2:10-2:30	Through a Glass Darkly: Issues With Inferring Distribution and Abundance from Survey Data	David Fullerton, MWD
2:30-2:50	Catch Me if You Can: Quantifying Relative Species and Size Selectivity of IEP Fish Trawls	Matt Dekar, USFWS
2:50 – 3:10	Implementation of Central Valley Steelhead Monitoring	Ryan Fournier, CDFW

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**3:10 – 3:30**      **Break**

## **SESSION VI – EVERYBODY TALKS ABOUT IT, WHAT ARE WE DOING ABOUT IT?**

### **COLLABORATIVE SCIENCE PANEL DISCUSSION**

**3:30-5:00**

MODERATOR: BOB LOHN (RETIRED, NMFS REGIONAL ADMINISTRATOR)

PARTICIPANTS: JEFF KEAY (USGS), REN LOHOEFENER (USFWS), TIM VENDLINKSI (USEPA), BYRON BUCK (STATE AND FEDERAL CWA), CHRISTINA SWANSON (NRDC), PETER GOODWIN (DSC)

Location: Sierra Ballroom

**5:00 – 7:00**      **IEP Poster Reception**  
Location: Pavilion

## FRIDAY, APRIL 26

### SESSION VII – WATER QUALITY AND LOWER TROPHIC DYNAMICS

Moderator: Erin Gleason (USFWS)

Location: Sierra Ballroom

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8:10-8:30	Sediment Concentration Declines in the San Francisco Bay and Delta: A Summary	Tara Morgan-King, USGS
8:30-8:50	Influence of Particle Properties on Habitat Quality in the San Francisco Estuary	Mike Sauer, USGS
8:50-9:10	Distribution of the Copepod <i>Pseudodiaptomus forbesi</i> in Salinity-space	Karen Kayfetz, SFSU-RTC
9:10-9:30	Stable Isotope Analysis of Historical Zooplankton Samples Documents Food Web and Biogeochemical Changes in the San Francisco Estuary	Julien Moderan, SFSU-RTC
9:30-9:50	Limnology of the Sacramento River Deepwater Ship Channel, 2012	Erwin Van Nieuwenhuyse, USBR
9:50-10:10	Effects of the Cyanobacteria <i>Microcystis aeruginosa</i> on a Copepod in the San Francisco Estuary	Rita Dumais, SFSU-RTC

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**10:10 – 10:30      Break**

### SESSION VIII – EXAMINING HEALTH AND DIET THRESHOLDS OF DELTA SMELT

Moderator: Erin Foresman (EPA)

Location: Sierra Ballroom

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10:30-10:50	The Effect of Winter Food Limitation on Delta Smelt Growth and Reproduction – A Pilot Study	Meredith Nagel, UCD
10:50-11:10	Evaluation of Delta Smelt Diet and Nutritional Status During Juvenile Rearing and Adult Spawning Stages	Shawn Acuna, UCD and Steve Slater, CDFW
11:10-11:30	Temperature-dependent Food Consumption of Different Delta Smelt Life Stages	Kai Eder, UCD
11:30-11:50	Does Turbidity Matter for the Health and Reproductive Condition of Delta Smelt	Dolores Baxa, UCD
11:50-12:10	Turbidity, Salinity and Temperature Effects on Physiological and Molecular Stress Responses and Feeding in Juvenile Delta Smelt ( <i>Hypomesus transpacificus</i> )	Matthias Hasenbein, UCD

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**12:10 – 1:30      Lunch**

Location: Area restaurants

## SESSION IX – TIDAL HABITAT RESTORATION IN THE SAN FRANCISCO BAY: EXAMPLES OF HOW TO MONITOR AND DETECT ECOSYSTEM CHANGE

Moderator: Rachel Johnson (USBR)

Location: Sierra Ballroom

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1:30-1:50	Fish Monitoring in the South Bay Salt Pond Restoration Program	Jim Hobbs, UCD
1:50-2:10	Exploring Agricultural Land as Rearing Habitat for Juvenile Salmon at Knaggs Ranch in the Yolo Bypass	Louise Conrad, CDWR
2:10-2:30	Ecological Modeling of the Liberty Island Marsh Ecosystem	Enrique Reyes, ECU
2:30-2:50	Restoration at the Landscape Scale in the San Francisco Bay Delta	Michelle Orr, ESA

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### 2:50- 3:10 BREAK

## SESSION X – FROM THE RIVERS TO THE BAY II: EXAMINING BIOLOGICAL PRODUCTION, FISH MOVEMENTS AND TRENDS

Moderator: Pat Brandes (USFWS)

Location: Sierra Ballroom

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3:10-3:30	Does Elevated Ammonia Negatively Impact Phytoplankton Biomass and Community Composition?	Bhupinder Dhaliwal, CCCSD-Consultant
3:30-3:50	Does the Past Predict the Future? Trends and Cycles in San Francisco Estuary Fish Populations from 30+ Years of IEP Sampling	Kathy Hieb, CDFW
3:50-4:10	Late-fall Run Chinook Salmon ( <i>Oncorhynchus tshawytscha</i> ) Smolts and the San Francisco Estuary: Friend or Foe?	Bruce MacFarlane, NFMS
4:10-4:30	Seasonal Movement and Residence Patterns of Sub-adult Striped Bass in the San Francisco Estuary Watershed	Cynthia LeDoux-Bloom, CDWR

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## 2013 IEP Workshop Posters

### Evaluation Process for Restoration Design Alternatives Using DRERIP Conceptual Models

Atkins C.<sup>1</sup>, A. Ballard<sup>1</sup>, B. Herbold<sup>2</sup>, S. Siegel<sup>3</sup>, and C. Enright<sup>4</sup>

<sup>1</sup> California Department of Fish and Wildlife, Sacramento, CA

<sup>2</sup> Retired, Environmental Protection Agency

<sup>3</sup> Wetlands and Water Resources, San Rafael, CA

<sup>4</sup> Delta Science Program, Delta Stewardship Council, Sacramento, CA

### Comparison of Adult Delta Smelt Prey use Between Wet (2011) and Dry (2012) Winters

Bippus T., A. Cardoza, T. Lee, P. Poirier, and S. Slater

California Department of Fish and Wildlife, Stockton, CA

### Is There a Credible Alternative to Monitoring Delta Smelt Abundance?

Blankenship S.<sup>1,2</sup> and G. Schumer<sup>1,2</sup>

<sup>1</sup> Cramer Fish Sciences, West Sacramento, CA

<sup>2</sup> Department of Agricultural and Environmental Sciences, University of California, Davis

### Delta Science Plan – One Delta, One Science

Brand M., L. Correa, C. Enright, P. Goodwin, S. Harader, L. Hastings, R. Hoenicke, M. Holland, G. Isaac, M.

Koller, K. Morrice, E. Mortazavi, and J. Vinton

Delta Science Program, Delta Stewardship Council, Sacramento, CA

### Quantifying Incidence of Predation Using Genetic Barcodes and its Potential as a Near Real-Time Ecological Monitoring Tool

Brandl S.<sup>1</sup>, G. Schumer<sup>2</sup>, B. Schreier<sup>3</sup>, J. Louise Conrad<sup>3</sup>, B. May<sup>1</sup>, and M. Baerwald<sup>1</sup>

<sup>1</sup> Genomic Variation Lab, University of California, Davis.

<sup>2</sup> Cramer Fish Sciences/Genidaqs, West Sacramento, CA

<sup>3</sup> Aquatic Ecology Section, Department of Water Resources, West Sacramento

### Otolith Strontium Isotope Life History Reconstructions of Delta Smelt, *Hypomesus transpacificus*

Bush, E.<sup>1</sup> J. Cook<sup>1</sup>, N. Ikemiyagi<sup>2</sup>, G. Ramos<sup>1</sup>, and J. Hobbs<sup>1</sup>

<sup>1</sup> Department of Wildlife, Fish & Conservation Biology, University of California, Davis

<sup>2</sup> California Department of Water Resources, West Sacramento, CA

### Modeling The Response Of Delta Smelt *Hypomesus transpacificus* to Fall Outflow and Community Composition in the Low Salinity Habitat

Castillo G.

US Fish & Wildlife Service, Lodi, CA

### Visualizing Juvenile Salmonid Behavior, Mortality and Salvage in the Delta: Practical Application of an Individual Based Model

Cavallo B.<sup>1</sup> and T. Hinkelman<sup>2</sup>

<sup>1</sup> Cramer Fish Sciences, Auburn, CA

<sup>2</sup> Datavore Consulting, Lincoln, NE

Compilation of Historical DFW Survey Data of the Arc Project Study Regions: The North Delta Region, Sherman Island, and the Eastern Suisun Marsh Region

Chandos A., J. Durand, P. Moyle, M. Young, K. Perales, and J. Montgomery

Department of Wildlife, Fish & Conservation Biology, University of California, Davis

An Evaluation of the Sensitivity of Lab-Reared and Field-Collected *Hyaletta azteca* to the Pyrethroid Insecticide Bifenthrin

Clark S.<sup>1</sup>, R. Ogle<sup>1</sup>, A. Gantner<sup>1</sup>, and G. Mitchell<sup>2</sup>

<sup>1</sup>Pacific EcoRisk, Fairfield, CA.

<sup>2</sup>FMC Agricultural Products, Ewing, NJ.

FLaSH: Growth Dynamics of Delta Smelt, *Hypomesus transpacificus*

Cook J.<sup>1</sup>, Bush, E.<sup>1</sup>, N. Ikemiyagi<sup>2</sup>, G. Ramos<sup>1</sup>, and J. Hobbs<sup>1</sup>

<sup>1</sup>Department of Wildlife, Fish & Conservation Biology, University of California, Davis

<sup>2</sup>California Department of Water Resources, West Sacramento, CA

Site Specific Growth of Largemouth Bass, *Micropterus salmoides*, in the SF Bay-Delta

Cook J.<sup>1</sup>, J. Hobbs<sup>1</sup>, F. Feyrer<sup>2</sup>, A. Chandos<sup>1</sup>, C. Balagot<sup>1</sup>, S. Hanson<sup>1</sup>

<sup>1</sup>Department of Wildlife, Fish & Conservation Biology, University of California, Davis

<sup>2</sup>United States Bureau of Reclamation

Experience the Estuary Workgroup (CEMW) Decision Support Toolset and Projects

Cowin K.<sup>1</sup>, S. Fong<sup>1</sup>, B. Templin<sup>2</sup>, and A. Weber-Stover<sup>3</sup>

<sup>1</sup>State and Federal Contractors Water Agency, Sacramento, CA

<sup>2</sup>California Department of Water Resources, West Sacramento, CA

<sup>3</sup>The Bay Institute, San Francisco, CA

Patterns of Movement and Residency of Sacramento Splittail in a Remnant Tidal Marsh

De Carion D.<sup>1</sup>, J. Durand<sup>1</sup>, T. O'Rear<sup>1</sup>, A. Sih<sup>2</sup>, and P. Moyle<sup>1</sup>

<sup>1</sup>Department of Wildlife, Fish & Conservation Biology, University of California, Davis.

<sup>2</sup>Department of Environmental Science & Policy, University of California, Davis.

Continuous Nitrogen and Phosphorus Monitors in Liberty Island, Cache Slough at Ryer Island and Sacramento River at Decker Island

Bryan D., B. Bergamaschi, J. Saraceno, B. Pellerin, M. Sauer and R. Fujii

US Geological Survey, Sacramento, CA

The Past, Present and Future of the Passage Assessment Database; a Tool for Stream Habitat Connectivity Restoration via the Publicly Available Calfish Website

Elston A.<sup>1</sup>, and L. Ryley<sup>2</sup>

<sup>1</sup>Pacific States Marine Fisheries Commission, Sacramento, CA

<sup>2</sup>Pacific States Marine Fisheries Commission, Monterey, CA

Enzymatic and Histopathologic Biomarkers of Delta Smelt, *Hypomesus transpacificus*

Gandhi, S and S. Teh

School of Veterinary Medicine, Department of Anatomy, Physiology and Cell Biology, University of California, Davis

## EcoAtlas: An Online Management Support Tool for the Delta and San Francisco Bay Ecosystem

Grosso C., K. Cayce, P. Frontiera, and M. Williams

San Francisco Estuary Institute - Aquatic Science Center, Richmond, CA

## Ecosystem Restoration Program Overview

Grover J.<sup>1</sup>, J. Garcia<sup>1</sup>, J. Roeh<sup>1</sup>, M. Dunne<sup>2</sup>, and T. Porter<sup>2</sup>

<sup>1</sup>California Department of Fish and Wildlife, Sacramento, CA

<sup>2</sup>California Department of Fish and Wildlife, Rancho Cordova, CA

## The Comparative Toxicity of Five Pesticides in *Hyalella azteca* and *Chironomus dilutus*

Hasenbein S.<sup>1</sup>, K. Callinan<sup>1</sup>, J.P. Geist<sup>2</sup>, I. Werner<sup>3</sup>, A.K. Miles<sup>4</sup>, R.E. Connon<sup>1</sup>, S. Teh<sup>1</sup>, and S.P. Lawler<sup>5</sup>

<sup>1</sup>School of Veterinary Medicine, Department of Anatomy, Physiology and Cell

Biology, University of California, Davis

<sup>2</sup>Chair of Aquatic Systems Biology, Technische Universitaet Muenchen, Germany

<sup>3</sup>Swiss Centre for Applied Ecotoxicology, Eawag/EPFL, Duebendorf, Switzerland

<sup>4</sup>US Geological Survey, Western Ecological Research Center, University of California, Davis

<sup>5</sup>Department of Entomology, University of California, Davis

## Collaborative Data Management with the CERES Library

Harris D.

CERES, California Natural Resources Agency, Sacramento, CA

## Do Increased Temperature and Salinity Influence the Success of Cyanobacteria in the San Francisco Bay Delta?

Johnson A., A. Parker, and F. Wilkerson

Romberg Tiburon Center, San Francisco State University, Tiburon, CA

## The Effects of Salinity on Longfin Smelt Larvae in Rearing Trials

Kammerer B., G. Tigan, and J. Lindberg

School of Veterinary Medicine, Fish Conservation and Culture Lab, University of California, Davis

## Ecosystem Restoration Program Delta Project Highlights

Lasko G., and D. Burmester

California Department of Fish and Wildlife, Water Branch, Sacramento, CA

## Ammonium vs. Nitrate Uptake by the Cyanobacter, *Microcystis aeruginosa*, in the San Francisco Estuary Delta

Lee J., A. Parker, and F. Wilkerson

Romberg Tiburon Center-San Francisco State University, Tiburon, CA

## The Importance of Vegetated Versus Open Water Ponds to Material Flux in the Freshwater Tidal Wetland Liberty Island, California

Lehman P.<sup>1</sup>, S. Mayer<sup>2</sup>, B. Larsen<sup>2</sup>, and M. Dempsey<sup>1</sup>

<sup>1</sup>Division of Environmental Services, California Department of Water Resources, West Sacramento, CA

<sup>2</sup>North Central Region Office, California Department of Water Resources, West Sacramento, CA

## Characterization of the *Microcystis* Bloom and its Nitrogen Supply in San Francisco Estuary Using Stable Isotopes

Lehman P.<sup>1</sup>, C. Kendall<sup>2</sup>, M. Guerin<sup>3</sup>, M. Young<sup>2</sup>, S. Silva<sup>2</sup>, G. Boyer<sup>4</sup> and S. Teh<sup>5</sup>.

<sup>1</sup>Division of Environmental Services, California Department of Water Resources, West Sacramento, CA

<sup>2</sup>United States Geological Survey, Menlo Park

<sup>3</sup>Research Management Associates, Fairfield, CA,

<sup>4</sup>College of Environmental Science and Forestry, State University of New York, Syracuse, New York,

<sup>5</sup>School of Veterinary Medicine, Department of Anatomy, Physiology and Cell Biology, University of California, Davis

## A New Exotic Shrimp within the San Francisco Estuary: Coming to a River Near You

Miklos P. and D. Barnard

US Fish & Wildlife Service, Lodi, CA

## Energetics of the Invasive Clam, *Potamocorbula amurensis*: The Interactive Role of Temperature, Salinity, and Food Availability

Miller N.<sup>1</sup>, X. Chen<sup>1</sup>, and J. Stillman<sup>1, 2</sup>

<sup>1</sup>Romberg Tiburon Center, San Francisco State University, Tiburon, CA

<sup>2</sup>Department of Integrative Biology, University of California, Berkeley

## Effects of Fin Ray Removal on the Swimming Performance of Sub-adult White Sturgeon

Nguyen P.<sup>1</sup>, D. Peterson<sup>1</sup>, and Z. Jackson<sup>2</sup>

<sup>1</sup>Warnell School of Forestry and Natural Resources, University of Georgia, Athens

<sup>2</sup>U.S. Fish and Wildlife Service, Lodi, CA

## Building and Implementing New Ecological Indicators for California's Streams and Rivers

Ode P. and A. Rehn

Aquatic Bioassessment Laboratory, California Department of Fish and Wildlife, Rancho Cordova, CA

## The Summer Towntnet Delta Smelt Index: A Comparison of Methods

Osborn K. and M. Avila

California Department of Fish and Wildlife, Stockton, CA

## Developing Technology Solutions to Support Co-Equal Goals and the Larger Delta Community

Osti A.<sup>1</sup>, Osti D.<sup>1</sup>

<sup>1</sup>34 North Inc, Truckee, CA

## Exploring Water Quality Trends, with an Emphasis on Chlorophyll A, Using Georeferenced Water Quality Data within the Tidal Freshwater Cache Slough Complex

Perales K., M. Young, J. Durand, T. O'Rear, J. Montgomery, A. Chandos, J. Hobbs, and P. Moyle.

Center for Watershed Sciences, University of California, Davis

## A Morphometric-based Index of Fish Somatic Condition of Delta Smelt, *Hypomesus transpacificus*

Ramos G.<sup>1</sup>, S. Acuña<sup>2</sup>, J. Hobbs<sup>1</sup>, and S. Teh<sup>2</sup>

<sup>1</sup>Department of Wildlife, Fish & Conservation Biology, University of California, Davis

<sup>2</sup>School of Veterinary Medicine, Aquatic Health Program, University of California, Davis

## CalFish and the California Fish Passage Assessment Database

Ryley L.

Pacific States Marine Fisheries Commission, Monterey, CA

## Reproduction and Mortality of Key Copepods Low-Salinity and Freshwater Habitats of the San Francisco Estuary

Slaughter A. and W. Kimmerer

Romberg Tiburon Center, San Francisco State University, Tiburon, CA

## Adaptive Management of Tidal Marsh Habitat Restoration in the Delta: Addressing Uncertainties in Aquatic Food Web Responses

Spautz H.<sup>1</sup>, J. Rosenfield<sup>2</sup>, J. Downs<sup>1</sup>, N. Clipperton<sup>1</sup>, A. Ballard<sup>1</sup>, C. Wilcox<sup>1</sup>, K. Fritsch<sup>1</sup>, and D. Zezulak<sup>1</sup>

<sup>1</sup>California Department of Fish and Wildlife, Water Branch, Sacramento, CA

<sup>2</sup>The Bay Institute, San Francisco, CA

## Unprecedented Bloom of Toxin-producing Cyanobacteria in the Southern Bay-Delta Estuary Has Negative Impact on the Aquatic Food Web

Spier C.<sup>1</sup>, W.Stringfellow<sup>1,3</sup>, J. Hanlon<sup>1,3</sup>, M.Brunell<sup>1,2</sup>, M. Estiandan<sup>1,2</sup>, T. Koski<sup>4</sup>, J. Kääriä<sup>4</sup>

<sup>1</sup>Ecological Engineering Research Program, School of Engineering & Computer Science, University of the Pacific, Stockton, CA

<sup>2</sup>Department of Biological Sciences, University of the Pacific, Stockton, CA

<sup>3</sup>Lawrence Berkeley National Laboratory Earth Sciences Division, Berkeley, CA

<sup>4</sup>Turku University of Applied Sciences, Turku, Finland

## When to Bolt: Fry or Smolt? Estimating Survivorship of Juvenile Salmon Migratory Life Histories Using Otolith Strontium Isotopes

Sturrock A.<sup>1</sup>, T. Heyne<sup>2</sup>, J. Wikert<sup>3</sup>, C. Mesick<sup>3</sup>, P. Weber<sup>4</sup>, G. Whitman<sup>1</sup>, J. Glessner<sup>5</sup>, and R. Johnson<sup>1,6</sup>

<sup>1</sup> Institute of Marine Sciences, University of California, Santa Cruz

<sup>2</sup> California Department of Fish and Wildlife, Tuolumne River Restoration Center, La Grange, CA

<sup>3</sup> US Fish and Wildlife Service, Anadromous Fish Restoration Program, Lodi, CA

<sup>4</sup>Livermore National Laboratory, Chemical Sciences Division, Livermore, CA

<sup>5</sup> Interdisciplinary Center for Plasma Mass Spectrometry, Department of Geology, University of California, Davis

<sup>6</sup> US Bureau of Reclamation Bay-Delta Office , Applied Sciences Branch, Sacramento, CA

## Evaluating Fish Behavior Using Acoustic Telemetry

Sullivan C., K. Kumagai, S. Johnston, and B. Rowdon

HTI Hydroacoustic Technology Inc., Seattle, Washington

## Development of New Genetic Resources for Management of Central Valley Chinook Salmon

Tomalty K., M. Meek, M. Baerwald, M. Stephens, A. Goodbla, B. May

Department of Animal Science, University of California, Davis

## Zebra/Quagga Mussel Monitoring and Research in the State Water Project

Veldhuizen T. and B. Sakata

California Department of Water Resources, Sacramento, CA

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How Does Nitrogen Redox State and N:P Stoichiometry Influence Phytoplankton?

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Preliminary Findings on Fish Communities along the North Delta “Arc”

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